

REMARKS

1. Rejections

Claims 1-6 stand rejected under 35 U.S.C. § 103(a), as allegedly rendered obvious by Japanese Patent No. 2000-105093 to Haruhiko in view of U.S. Patent No. 2,017,201 to Bossart et al. (“Bossart”). Applicant respectfully traverses.

2. 35 U.S.C. § 103(a)

Claims 1-6 stand rejected as allegedly rendered obvious by Haruhiko in view of Bossart. Specifically, the Office Action and Advisory Action alleges that Haruhiko discloses or suggests each and every element as set forth in claims 1-6 except that the projection portions extend in an oblique direction relative to the inner fin. Nevertheless, the Office Action alleges that Bossart discloses or suggests these missing elements.

In order for the Office Action to establish a prima facie case of obviousness, at least three criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to those of ordinary skill in the art, to modify the primary reference as proposed by the Office Action. Second, there must be a reasonable expectation of success. Third, the prior art references must disclose or suggest all the claim limitations. MPEP 2143 (emphasis added.) For the reasons set forth below, Applicant maintains that the Office Action fails to establish a prima facie case of obviousness.

Applicant has amended claims 1 and 4 to describe a heat exchanger in which “said plurality of projection portions are positioned across the width of said refrigerant path.” (Emphasis added.) For example, “projection portions 50 and projection portions 51 may be formed integrally with first tube plate 44 and second tube plate 45, respectively, such that the number of parts or components of heat exchanger may not increase. Moreover, because projection portions 50 and recess portions 54 are formed across the width of refrigerant path 46, recess portions 54 may be in fluid communication with drain path 56. Similarly, because projection portions 51 and recess portions 55 are formed across the width of refrigerant path 47, recess portions 55 also may be in fluid communication with drain path 56. Consequently, as shown in **Fig. 11**, water may not be retained between heat transfer tube 43 and outer fin 3 because recess portions 54 and 55 guide the water to drain path 56.” See, e.g., Appl’n, Page 7 Lines 27-31; Page 8, Lines 1-4; and Figs. 8-11.

In contrast, Haruhiko describes a heat exchanger 1 which may comprise a plurality of tubes 2, and each tube 2 may comprise a first metal tube plate 4 and a second metal tube plate 4. Moreover, a pair of inner fins 53 and 54 may be positioned between the first and the second tube plates 4, and between one and four protrusions 70 may be formed on the first tube plate 4. Nevertheless, protrusions 70 do not extend in an oblique direction relative to inner fins 53 and 54, and do not extend across a width of refrigerant paths 2a or 2b. See, e.g., Haruhiko, **Fig. 10** (emphasis added.)

Bossart describes a heat exchanger which may comprise a plurality of tubes 12. Each tube 12 may be formed by bending a piece of sheet metal so as to form a first tube plate 14 and a second tube plate 15. A first plurality of protrusions 33 may be formed on first tube plate 14, and a second plurality of protrusions 34 may be formed on second tube plate 15. Moreover, in an embodiment, each protrusion 33 may be slanted in a first direction, and each protrusion 34 may be slanted in a second direction, such that a first lengthwise plane which includes protrusion 33 crosses with a second lengthwise plane which includes protrusion 34. See, e.g., Bossart, **Fig. 10**. Nevertheless, protrusions 33 and 34 do not extend across a width of a refrigerant path. See, e.g., Bossart, **Fig. 3**. Thus, Haruhiko in view of Bossart at least fails to disclose or suggest a heat exchanger in which “said plurality of projection portions are positioned across the width of said refrigerant pa,” as set forth in amended claims 1 and 4. Therefore, Applicants respectfully request that the Examiner withdraw the obviousness rejection of claims 1 and 4.

Claims 2 and 5 depend from amended claims 1 and 4, respectively. “If an independent claim is non-obvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious.” MPEP 2143.03 (citations omitted). Therefore, Applicant respectfully requests that the Examiner also withdraw the obviousness rejection of claims 2 and 5.

CONCLUSION

Applicant respectfully submits that this application is in condition for allowance, and such disposition is earnestly solicited. If the Examiner believes that an interview with Applicant’s representatives, either in person or by telephone, would expedite prosecution of this application, we would welcome such an opportunity. Applicant is including a check in the amount of \$750 covering the requisite large entity filing fee for a Request for Continued Examination. Nevertheless, in the event of any variance between the fees determined by

Applicant and those determined by the U.S. Patent and Trademark Office, please charge any such variance to the undersigned's Deposit Account No. 02-0375.

Respectfully submitted,

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Dated: May 5, 2003

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MARKED-UP COPY OF AMENDMENTS TO THE CLAIMS

IN THE CLAIMS:

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Please cancel original claims 3 and 6, without prejudice.

Please amend original claims 1 and 4, as follows:

1. (amended) A stacked-type, multi-flow heat exchanger comprising:
a plurality of heat transfer tubes, wherein each of said heat transfer tubes comprises:
a first tube plate;
a second tube plate connected to said first tube plate, wherein said first tube plate and said second tube plate form a refrigerant path within said heat transfer tube; and
an inner fin having a wave shape, wherein said inner fin is positioned within said refrigerant path and extends in a longitudinal direction along said refrigerant path;
a plurality of outer fins, wherein said plurality of outer fins and said plurality of heat transfer tubes are stacked alternately; and
a plurality of projection portions formed on at least one of said first tube plates and on at least one of said second tube plates, wherein said plurality of projection portions project into said refrigerant path and extend in an oblique direction relative to said inner fin, [wherein] said inner fin is connected to said plurality of projection portions, and said plurality of projection portions are positioned across the width of said refrigerant path.
4. (amended) A stacked-type, multi-flow heat exchanger comprising:
a plurality of heat transfer tubes, wherein each of said heat transfer tubes comprises:
a tube plate, wherein said tube plate comprises a flange portion positioned along a center axis of said tube plate, such that when said tube plate is folded along said center axis, said flange portion forms a refrigerant path within said heat transfer tube; and
an inner fin having a wave shape, wherein said inner fin is positioned within said refrigerant path and extends in a longitudinal direction along said refrigerant path;
a plurality of outer fins, wherein said plurality of outer fins and said plurality of heat transfer tubes are stacked alternately; and
a plurality of projection portions formed on at least one of said tube plates wherein said plurality of projection portions project into said refrigerant path and extend in an oblique direction relative to said inner fin, [wherein] said inner fin is connected to said plurality of

projection portions, and said plurality of projection portions are positioned across the width of said refrigerant path.